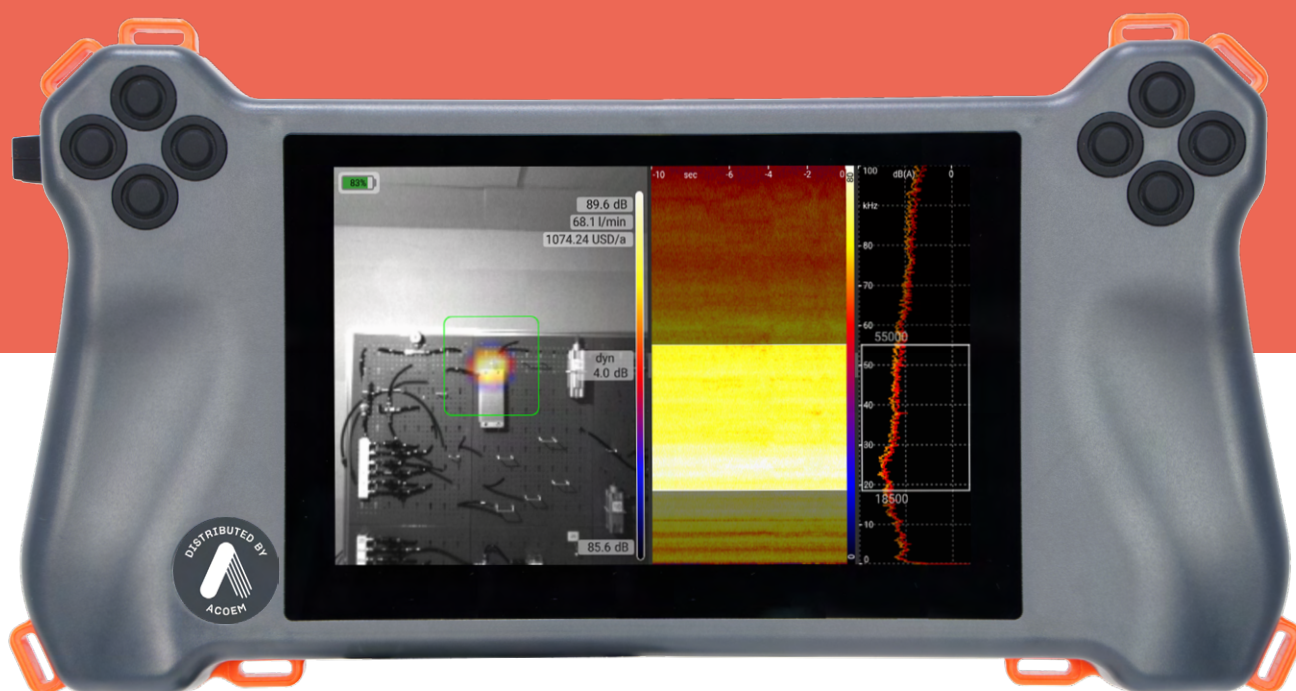# Soundcam Ultra 3

The Most Versatile & Powerful Ultrasound Camera

Why SoundCam Ultra 3?

- A wide frequency range for more sensitive detection and better noise suppression

- Ready for all applications with 4 modes: Pro, Easy, Leakage and Partial Discharge

- Don't miss anything by re-defining the frequency range later on*

- Pinpoint listen-in including making ultrasound audible

- A high frame rate of the acoustic video for the detection of transient sounds and for distinguishing between transient and permanent sounds

- Global shutter and high frame rate of the optical video for fast-moving objects or fast-movements

- High frame rate synchronized acoustic and camera video shows sound origin and propagation

Highlights

- 176 microphones at 200 kHz
- Live, on-screen results at 100 fps
- Very high sensitivity with 176 microphones
- Thermal imaging camera integrated
- Handheld and IP54 waterproof
- Integrated LEDs for illumination
- GPS incl. orientation*
- Re-definable frequency range*

Applications

- Compressed air/gas/vacuum leak detection
- Partial discharge detection
- Condition-based monitoring
- Wildlife studies
- Non-destructive testing

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Soundcam | Technical Specifications

Hardware		
Physical Properties	Dimensions	12.2 x 6.3 x 2.2 inch (31 x 16 x 5.5 cm)
	Weight	3.3 lb (1.5 kg)
	Waterproof	IP54
	Operation	Two, one-handed, shoulder strap, tripod
	Battery Life	10 h (3.5 h (built-in) + 6.5 h (external))
	Battery Charging Time	1.5 h (built-in) und 4 h (external)
	Tripod Socket	1/4 inch
	Buttons	8 configurable + on/off switch
	Operating Temp	-4°F to 122°F (-20°C to 50°C)
	Charging Temp	32°F to 113°F (0°C to 45°C)
	Storage Temp	-22°F to 140°F (-30°C to 60°C)
Display	Size	7 inch / 15 x 9.4 cm
	Resolution	1280 x 800 px
	Brightness	Adjustable
	Readability	Excellent through optical bonding
	Touch	Capacitive 10-finger touch
Embedded Controller	Internal Memory	1TB M.2 SSD
Interfaces	USB A 3.0	Data export
	Ethernet	LAN (for running the PC software)*
	Audio	3.5 mm port for headphones
	USB C	Charging and data export*
Microphones	Microphones	176 digital MEMS
	Frequency Range	Up to 100 kHz
	Sample Rate	200 kHz
	Sound Pressure	Max. 120 dB
	Resolution	24 bit
	Beamforming	100 fps
Optical Camera	Illumination	4 LEDs
	Aperture Angle	70° x 55° (FoV horizontal x vertical)
	Shutter	Global Shutter
	Night Vision	Yes (external IR illumination recommended)
Additional Sensors	ToF (Time of Flight)	Distance measurement for <1.5 m*
	GPS	Position incl. orientation*
Power	Built-In Battery	Li-ion battery (48 Wh)
	External Battery	Li-ion-battery (88 Wh) ; 0.6 x o.2 x 3.3 x 1 inch (16 x 8.5 x 2.5 cm)
	Input	20 V via USB C
	Management	Smart: work and charge at the same time

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Soundcam | Technical Specifications

Software	
OS	Linux (for the device), Windows (for laptop/PC)
HMI	Touchscreen, headphones, configurable buttons
Protection	Password (protection against unauthorized access)
Functions	Local and global spectrum (narrowband, 1/3rd octave and octave), spectrogram, acoustic, optical and thermal image
	Setting the distance
	Frequency filter (narrowband, 1/3rd octave and octave
	3 scaling modes: Smart, Auto, Manual
	Pinpoint listen-in (broadband or frequency-filtered) incl. making ultrasound audible
	Take photo with comment
Modes	**Pro:** Expert mode with extended range of functions
	Easy: Simplified modes for a quick start
	Leak: Optimized mode for the detection of leaks including real-time display of the loss rate
	Partial discharge: Optimized mode for the detection of partial discharges including real-time display of the PRPD diagram
	Network: Remote control of the device via the Windows software*
Recording	Ring buffer: 10 s, 30 s, 60 s or 180 s (Windows only)
	Trigger recording: SPL- or frequency-triggered up to 10 s with prerun plus post-run time
	Long-term measurement: One image (average and peak hold) every 10 to 900 seconds (adjustable)
Export	Photo, video, audio, measurement data
Units	Metric or imperial system
Languages	German, English, Spanish, Croatian, Italian, Japanese, Korean, Polish, Turkish, Chinese

Integrated Thermal Imaging Camera

- 2-in-1 device: Acoustic and thermal imaging camera in one device
- Simultaneous detection and recording of acoustic and thermal images
- Checking the correlation between acoustics and heat creates a deeper understanding of the result
- Improved detection of faults and anomalies through the combination of acoustic and thermal images
- Parallel evaluation of acoustic and thermal images enables more precise and comprehensive diagnosis and analysis
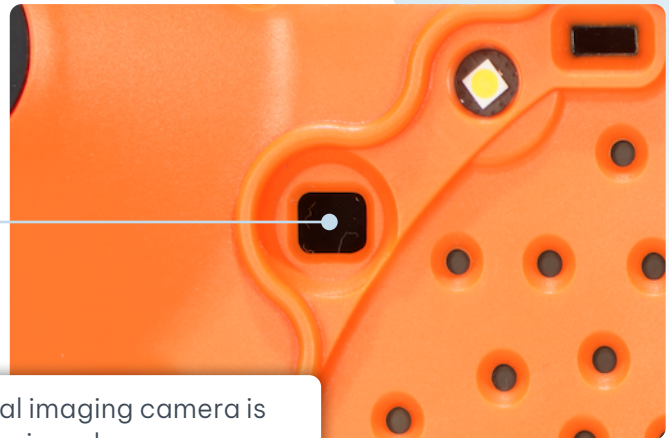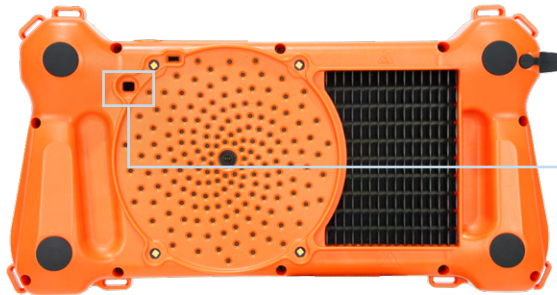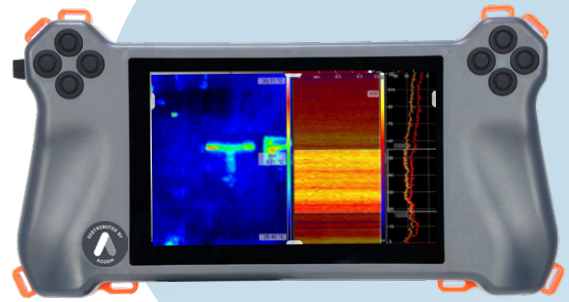
The integrated thermal imaging camera is located next to the microphone array.
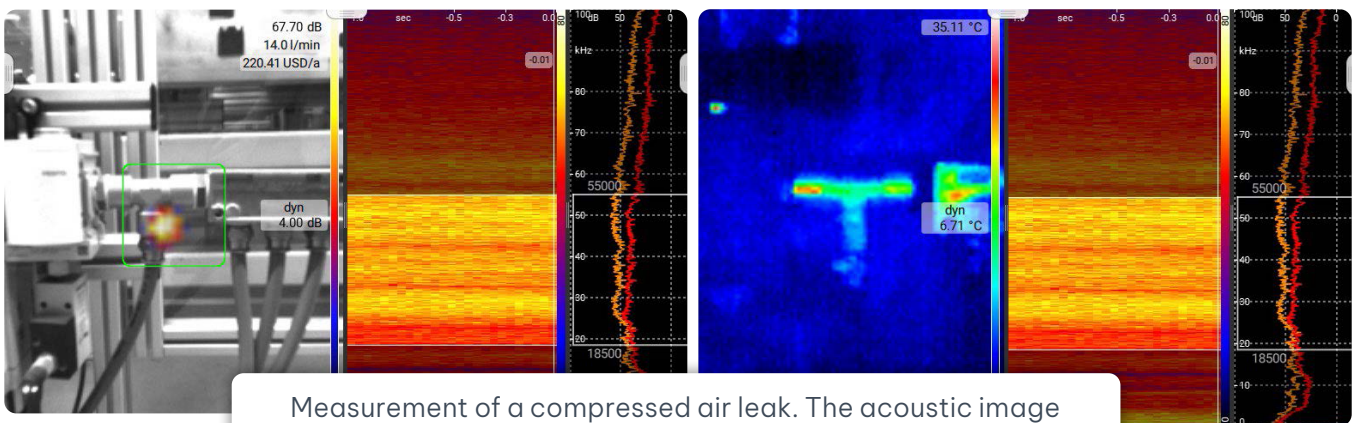
Measurement of a compressed air leak. The acoustic image can be seen on the left and the thermal image on the right.

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Soundcam | Thermal Imaging Specifications

| Thermal Imaging Camera	
Sensor Technology	Uncooled microbolometer
Thermal Spectral Range	Longwave infrared, 8 μm to 14 μm
Array Format	160 x 120 progressive scan
Pixel Size	12 μm
Frame Rate	8.7 fps
Temperature Compensation	Automatic. Output image independent of camera temperature.
Radiometric Accuracy	High Gain Mode: Greater of +/-41°F (+/-5°C) or 5% (typical)
Radiometric Accuracy	Low Gain Mode:Greater of +/-50°F (+/-10°C) or 10% (typical)
Non-uniformity Corrections	Integral Shutter
Scene Dynamic Range	High Gain Mode: 14° to 284°F (-10° to 140°C)
Scene Dynamic Range	Low Gain Mode: 14° to 752°F (-10° to 400°C)
Image Optimization	Factory configured and fully automated
FOV - Horizontal	57° (nominal)
FOV - Diagonal	71°
F-Number	f/1.1
Temperature Unit	Kelvin, Celsius, Fahrenheit
Color Palette	Color (rainbow), Fusion
Scaling Modes	Auto, Manual

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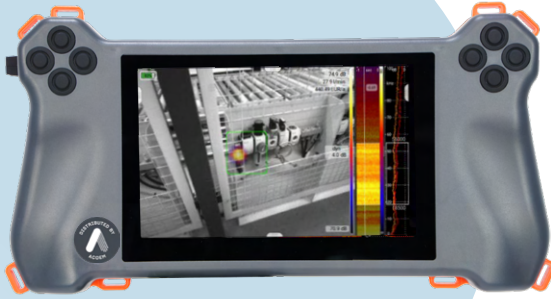
Application: Localizing Leaks

- Large-area scanning saves a lot of time compared to other leak-detection systems
- Detection from a great distance even during loud, ongoing production
- Get started immediately through leakage mode
- Real-time display of the loss rate
- Automatic distance measurement at close range for a more accurate estimate of leaks*
- The Windows software LeakReport evaluates the leaks, prioritizes them by size, and summarizes them into a report
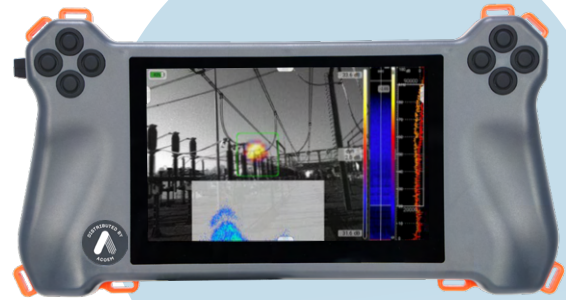- Front LED floodlights for illuminating dim areas
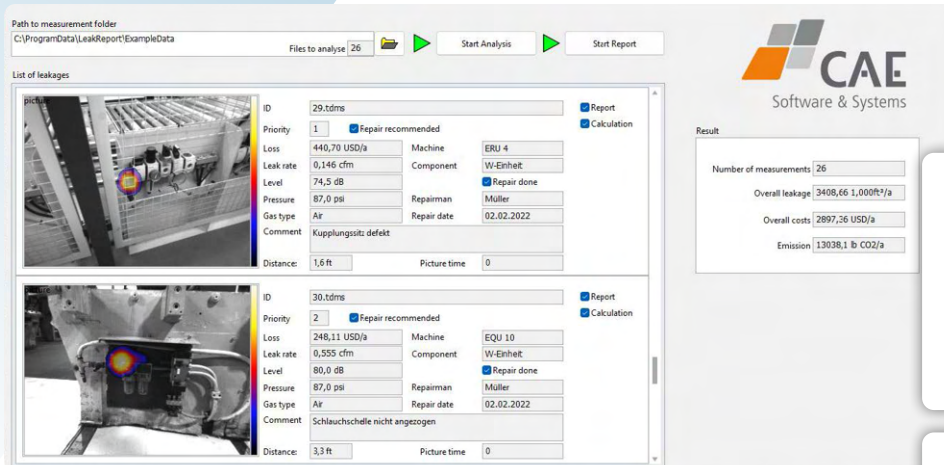
The Windows software LeakReport displays all leaks found, categorizes them by size and summarizes them into a report.

Two pie charts in the report provide a quick overview of the number of leaks found and the loss.
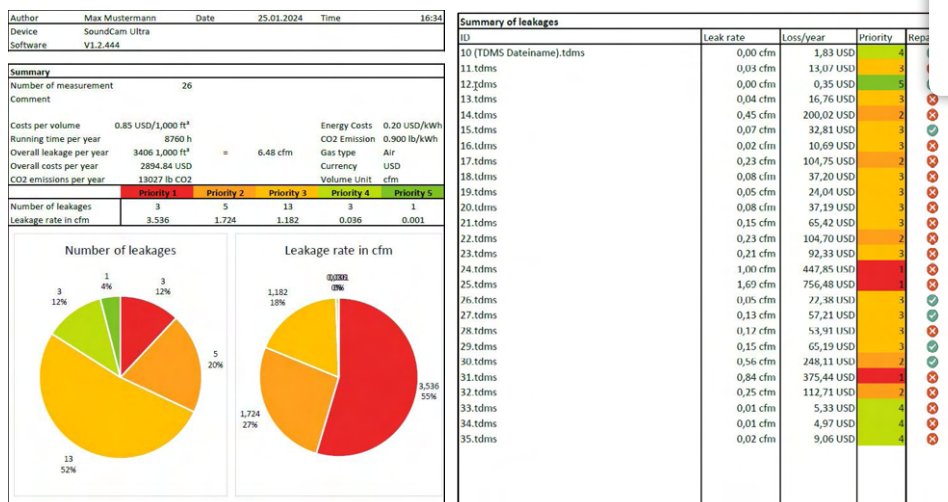
Application: Detection of Partial Discharges

- Large-area scanning saves a lot of time compared to other partial discharge measurement systems

- Contactless measurement is very easy to carry out

- Detection from a great distance, even in noisy surroundings

- Get started immediately through partial discharge mode

- Very good readability and high color transmission of the display thanks to optical bonding, even in bright sunlight

- Real-time display of the PRPD diagram

- The Windows software PDReport analyzes the partial discharges, categorizes them by type and summarizes them into a report

- GPS incl. orientation for clear identification of the equipment*

The Windows software PDReport displays all detected partial discharges, categorizes them by type and summarizes them into a report.

![acoem logo]

176 Microphones

The device's 176 microphones increase the sensitivity and dynamic range: the result of a conventional acoustic camera with around 70 microphones can be seen on the left. The large leakage is detected, but the smaller leakage is not. It disappears in the acoustic fog due to the limited dynamic range.

More microphones improve the sensitivity and dynamic range. On the right is the result of the Ultra 3. The large and small leaks are visible. Even at 20 dB dynamic range, no acoustic fog is visible.